the revenue-weighted output index.

Computation of the Index of Rail Output requires detailed data on freight movements distinguished by significant characteristics. Insofar as freight movements are non-homogenous, the significant heterogeneity can be captured by classifying movements by commodity type and length of haul. All of the data required to implement such a procedure are collected by the ICC on a quarterly basis as part of the one percent waybill sample. It is a straightforward matter to process the waybill data to obtain the Index of Rail Output. Computer programs to accomplish this are shown in Appendix 3.

E. Errors in Measurement of the Unadjusted CRI

Finally, note that the proposed methodology is immune to errors in the measurement of the Cost Recovery Index. The reason is that if the CRI is in error, the productivity correction will change so as to exactly offset the error. Referring back to the earlier results, recall that the Adjusted Cost Recovery Index can be written:

$$g = \text{CRI} \div \text{Productivity Index}$$

The Productivity Index equals:

$$\text{Index of Rail Output} \div \left[\frac{\text{Cost}(1)}{\text{Cost}(0)} \div \text{CRI}\right]$$

Thus an error in measuring the CRI will produce an equal and

opposite error in measuring the Productivity Index. The errors thus cancel.[9]

IV. Computation of the Productivity Index and the Adjusted Cost Recovery Index with Actual Railroad Data

Up to this point we have used simple numerical examples to clarify the logic of the proposed productivity adjustment to the CRI and the Adjusted CRI itself. The purpose of this section is to demonstrate that it is straightforward to carry out the same computations with actual railroad data.

For present purposes, we have limited ourselves to computations involving the most readily available data for U.S. railroads, both on an annual basis and a quarterly basis. We emphasize that nothing would preclude the extension of these

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[9] To illustrate this property of the proposed procedure, we use the actual index data from Table 1 below, which includes the following values for 1975, using 1974 data as the base year:

(1)	Relative Railroad Costs	1.011
(2)	Cost Recovery Index	1.138
(3)	Index of Railroad Input [(1)/(2)]	.889
(4)	Index of Rail Output	.906
(5)	Productivity Index [(4)/(3)]	1.020
(6)	Adjusted CRI [(2)/(5)]	1.116

In this example the Adjusted CRI is 1.116, obtained from division of the Cost Recovery Index (1.138) by the Productivity Index (1.020).

But suppose the CRI had been measured incorrectly, at 1.200 instead of 1.138. The Adjusted CRI would be unaffected, because the Productivity Index would change by an offsetting amount. The results would then be as follow:

(1)	Relative Railroad Costs	1.011
(2)	Cost Recovery Index	1.200
(3)	Index of Railroad Input [(1)/(2)]	.843
(4)	Index of Rail Output	.906
(5)	Productivity Index [(4)/(3)]	1.075
(6)	Adjusted CRI [(2)/(5)]	1.116

computations to additional years and quarters. We believe, however, that the following computations are more than sufficient to demonstrate the actual operation of our proposed methods.

We begin by presenting the computations for annual data, for which we use the years 1974 through 1980. All of the required data are presented in the top half of Table 1. A complete documentation of the sources of the data is presented in Appendix 4. Here we present only a brief description of each data series.

In column (1) of Table 1 we present railroad costs in billions of dollars. The concept of costs is the same as that used in the CRI -- total operating expenses plus fixed charges. In column (2) we present railroad costs relative to 1974. Each entry in this column is obtained by dividing the same year in column (1) by the 1974 level of costs. Thus each entry can be easily read as the proportionate increase in railroad costs since 1974. For example, railroad costs in 1980 were 1.670 time the 1974 level.

The rest of the columns of Table 1 are all indexes, that is, the absolute size of the numbers has no significance; it is only the change in the numbers from year to year that matters. For ease of interpretation we normalize all of the columns to be 1.000 in 1974, just as we did for railroad costs in column (2).

Column (3) contains the Cost Recovery Index. From 1977 to 1980 this is the actual CRI, as reported by the Association of American Railroads. From 1974 to 1976 it is the "Index of Railroad Material Prices, Wage Rates, and Supplements, Combined" (QMPW-108). The CRI nearly doubled from 1974 to 1980.

Table 1

Computation of the Productivity Index and the Adjusted Cost Recovery Index with Actual Annual Railroad Data

	(1) Railroad Costs (Billion $)	(2) Relative Railroad Costs	(3) Cost Recovery Index	(4) Index of Rail Input (2)/(3)	(5) Index of Rail Output	(6) Productivity Index (5)/(4)	(7) Adjusted CRI (3)/(6)
			INDEX LEVELS				
1974	16.394	1.000	1.000	1.000	1.000	1.000	1.000
1975	16.580	1.011	1.138	.889	.906	1.020	1.116
1976	18.511	1.129	1.260	.896	.956	1.066	1.181
1977	19.979	1.219	1.366	.892	.967	1.085	1.260
1978	21.919	1.337	1.482	.902	1.010	1.119	1.324
1979	24.966	1.523	1.668	.913	1.031	1.129	1.478
1980	27.378	1.670	1.914	.873	.989	1.134	1.688
			Annual Proportional Changes in the Indexes				
1975/1974		1.011	1.138	.889	.906	1.020	1.116
1976/1975		1.116	1.107	1.009	1.055	1.046	1.058
1977/1976		1.079	1.085	.995	1.012	1.017	1.066
1978/1977		1.097	1.085	1.011	1.043	1.032	1.051
1979/1978		1.139	1.125	1.012	1.021	1.009	1.116
1980/1979		1.097	1.147	.956	.960	1.005	1.142

The change in Rail Input can be computed directly as the change in railroad costs divided by the Cost Recovery Index. The result of this computation is presented in Column (4). Since the CRI increased more rapidly than Railroad costs from 1974 to 1980, Rail Input declined. In 1980, it was 87.3% of the 1974 level.

We have used the one percent waybill sample to compute the Index of Rail Output. In this computation we have differentiated all freight traffic into 400 distinct categories of freight movement based on type of commodity and length of haul. The resulting index is presented in Column (5). Rail Output declined from 1974 to 1975. It then increased in every year from 1976 to 1979. In 1980 it fell to a level slightly below the 1974 level.

The Productivity Index is computed as the ratio of Rail Output to Rail Input. The result of this computation is presented in Column (6). The Productivity Index was higher in each year after 1974 than it was in the previous year. In 1980 it was 1.134 times the 1974 level.

Finally, the Adjusted Cost Recovery Index can be computed as the CRI divided by the Productivity Index. The Adjusted CRI is presented in Column (7). It increased in every year after 1974, reaching in 1980 a level 1.688 times the 1974 level.

The top half of Table 1 is normalized to facilitate comparison of any year to 1974. It would also be convenient, however, to be able to tell at a glance the proportional increase in each column from one year to the next. This is easily accomplished by taking the ratio of each year's figures to the figures of the previous year. These yearly proportional

increases are presented in the bottom half of Table 1.

Almost all the figures in the bottom half of Table 1 exceed unity. Such numbers indicate increases in the particular indexes. The only exceptions occur for Rail Output and Rail Input. Rail Output declined in 1975 and in 1980. Rail Input also declined in 1975 and 1980, and in fact declined more than output. Thus productivity improved even in those two years where output declined. Rail Input also declined slightly in 1977.

In Table 2 we present computations of the Productivity Index and the Adjusted Cost Recovery Index for quarterly data covering the period 1977 through 1980. In the first page of the table all indexes are normalized to equal 1.000 in the first quarter of 1977. Thus each entry in Columns (2) through (7) indicates the level of the index relative to the first quarter of 1977. On the second page of Table 2 all entries in Column (2) through (7) indicate the proportional change in the index from the previous quarter.

In Table 1 we saw that for each year there were increases in railroad costs, the CRI, the Productivity Index, and the Adjusted CRI. In Table 2 we see that only the CRI increased in every quarter. There were four decreases in railroad costs, eight decreases in the Productivity Index, and six decreases in the Adjusted CRI, as well as numerous decreases in Rail Output and Input.

There were strong increases in railroad productivity in the second quarters of 1978 and 1979, both exceeding 10%. These surges in productivity coincided with the most rapid increases in

Table 2

Computation of the Productivity Index and the Adjusted Cost Recovery Index with Actual Quarterly Railroad Data

	(1) Railroad Costs (Billion $)	(2) Relative Railroad Costs	(3) Cost Recovery Index	(4) Index of Rail Input (2)/(3)	(5) Index of Rail Output	(6) Productivity Index (5)/(4)	(7) Adjusted CRI (3)/(6)
			INDEX LEVELS				
1977-1	4.781	1.000	1.000	1.000	1.000	1.000	1.000
1977-2	5.062	1.059	1.013	1.045	1.035	.991	1.023
1977-3	5.068	1.060	1.044	1.016	.979	.964	1.083
1977-4	5.074	1.061	1.054	1.007	.967	.961	1.097
1978-1	5.087	1.064	1.088	.978	.923	.944	1.152
1978-2	5.564	1.164	1.113	1.046	1.106	1.058	1.052
1978-3	5.465	1.143	1.137	1.006	1.030	1.024	1.110
1978-4	5.803	1.214	1.161	1.046	1.106	1.057	1.098
1979-1	5.676	1.187	1.199	.990	.980	.989	1.212
1979-2	6.149	1.286	1.226	1.049	1.145	1.091	1.123
1979-3	6.464	1.352	1.308	1.034	1.047	1.012	1.292
1979-4	6.651	1.391	1.343	1.036	1.076	1.039	1.293
1980-1	6.637	1.388	1.394	.996	1.034	1.038	1.343
1980-2	6.815	1.426	1.418	1.006	1.061	1.055	1.344
1980-3	6.865	1.436	1.482	.969	.967	.998	1.484
1980-4	7.077	1.480	1.499	.987	1.019	1.032	1.453

Table 2 (continued)

	(1) Railroad Costs (Billion $)	(2) Relative Railroad Costs	(3) Cost Recovery Index	(4) Index of Rail Input (2)/(3)	(5) Index of Rail Output	(6) Productivity Index (5)/(4)	(7) Adjusted CRI (3)/(6)
		Quarterly Proportional Changes in the Indexes					
1977-2/1977-1		1.059	1.013	1.045	1.035	.991	1.023
1977-3/1977-2		1.001	1.030	.972	.946	.973	1.058
1977-4/1977-3		1.001	1.010	.991	.988	.997	1.013
1978-1/1977-4		1.003	1.032	.971	.955	.983	1.050
1978-2/1978-1		1.094	1.023	1.069	1.198	1.120	.913
1978-3/1978-2		.982	1.021	.962	.931	.968	1.055
1978-4/1978-3		1.062	1.021	1.040	1.074	1.032	.989
1979-1/1978-4		.978	1.033	.947	.886	.936	1.104
1979-2/1979-1		1.083	1.022	1.059	1.169	1.103	.927
1979-3/1979-2		1.051	1.067	.986	.914	.927	1.150
1979-4/1979-3		1.029	1.027	1.002	1.028	1.026	1.001
1980-1/1979-4		.998	1.038	.962	.960	.999	1.039
1980-2/1980-1		1.027	1.017	1.010	1.026	1.016	1.001
1980-3/1980-2		1.007	1.045	.964	.912	.947	1.104
1980-4/1980-3		1.031	1.012	1.019	1.053	1.034	.979

output, both of which exceeded 15%. Several other quarters witnessed more modest productivity increases, but productivity declined in more quarters than it increased. All told, however, productivity in the fourth quarter of 1980 was 1.032 times the level in the first quarter of 1977.

The Adjusted CRI shows substantial declines in the two quarters of rapid productivity growth. In all other quarters the Adjusted CRI either decreased a small amount or increased. In the fourth quarter of 1980 the Adjusted CRI was 1.453 times the first quarter 1977 level, whereas the CRI itself was 1.499 times the first quarter 1977 level.

V. The Adjusted Cost Recovery Index Can Be Implemented on a Current Basis

The current cost recovery procedure makes use of a forecasted value of the Cost Recovery Index for the current quarter. The forecasted value is obtained by using regression analysis applied to historical values of the CRI. We propose use of an analogous procecure to forecast the adjusted CRI. In Appendix 5 we demonstrate that the productivity adjustment to the CRI can be accurately forecasted. Moreover, insofar as there is any error in forecasting railroad productivity, it can be corrected in subsequent quarters in exactly the same manner that errors in forecasting the CRI are corrected.

The CRI could be adjusted for productivity based on quarterly measurement of productivity or by distributing the annual measurement of productivity over the four quarters of the

year. We recommend that the latter procedure be adopted. The reason is that railroad productivity is quite volatile on a quarterly basis, reflecting seasonal differences in types of freight movements. Use of quarterly productivity measurements would introduce undesirable volatility into the Adjusted CRI. In the interest of rate stability we believe that a quarterly adjustment of the CRI, based on an annual measurement of railroad productivity, is the preferred procedure.

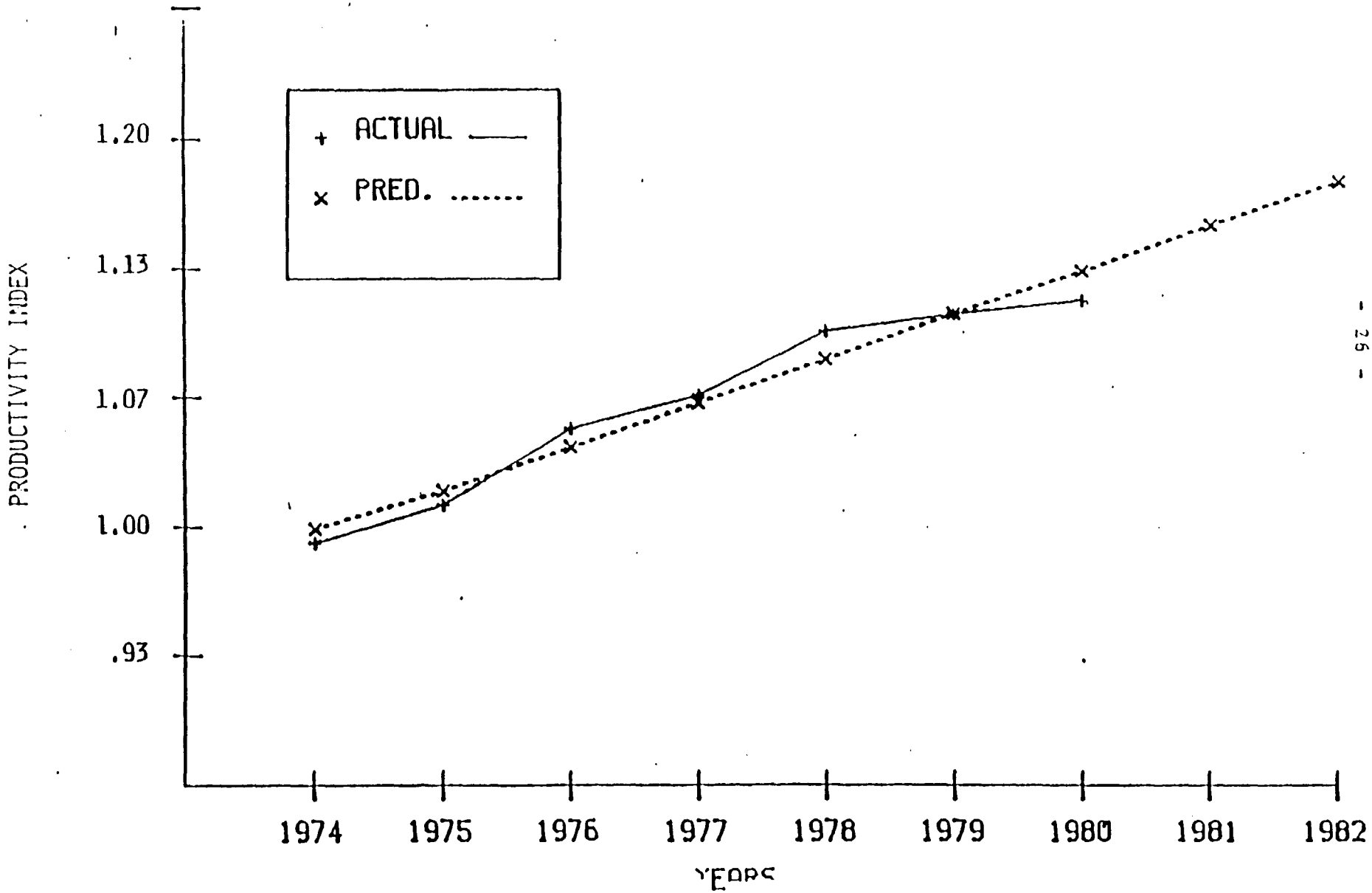
We have developed a procedure for forecasting productivity that tracks annual railroad productivity extremely well. Actual and predicted railroad productivity are shown in Figure 1. The exact values depicted in the figure are presented in Table 5-3 of Appendix 5.

Our forecasting procedure is based on separate forecasts of railroad output and railroad input. Railroad output is forecasted from ton-miles of traffic, real gross national product, and a time trend. Railroad input is forecasted from railroad output and a time trend. The separate forecasts of railroad output and input are then combined to provide a forecast of railroad productivity.

The forecast value for the Cost Recovery Index for the fourth quarter of 1982 is 1.159, relative to a 1980 fourth quarter value of 1.000. Our forecast value for the Productivity Index for the fourth quarter of 1982 is 1.043. Dividing the CRI by the Productivity Index we obtain 1.111 as the value of the Adjusted CRI. (These computations, along with the source data, are presented in Appendix 5).

FIGURE 1

PRODUCTIVITY INDEX (1974-1982)



The CRI increased from 1.000 to 1.159 in the eight quarters from 1980(4) to 1982(4); the adjusted CRI grew from 1.000 to 1.111. On an annualized basis these figures represent a growth rate of 7.7 percent per year for the CRI, but only 5.4 percent per year for the Adjusted CRI.

VI. A Program to Implement the Adjusted Cost Recovery Index Using a Forecasted Productivity Index

In the previous section and in Appendix 5 we demonstrate how the Adjusted Cost Recovery Index can be computed for the fourth quarter of 1982. The computation is based on forecasts of the Productivity Index and the Cost Recovery Index. A program for establishing forecasts of the CRI is already in place at the Commission and at the Association of American Railroads. We have demonstrated how to forecast values for the Productivity Index. Our forecasts of the Productivity Index are based upon historical data for the years 1974 through 1980. The forecasts only require annual data on: (1) total expenses plus fixed charges, (2) the Cost Recovery Index, (3) ton-miles and revenue shares by type of commodity, length of haul, and car ownership, (4) total ton-miles. All of these data are readily available. In addition to the 1974-1980 observations for these items, we have made use of the 1974-1981 values of real GNP and the 1981 observation for total ton-miles for estimation of the forecasting model. Finally, we have used a forecast of real GNP for 1982 to construct the 1982 forecasts.

The procedure for implementation of the Adjusted CRI for 1983 depends upon the type of information that is available at the time the Adjusted CRI must be computed. The Adjusted CRI for

1983 can be computed using only the information currently available. However, additional information will be available soon. The additional information that we can expect includes the 1981 waybill sample. In conjunction with 1981 total ton-miles, which is already known, the waybill data will permit the construction of the actual Index of Rail Output for 1981. Along with 1981 costs and the 1981 actual CRI, which are already known, the 1981 Index of Rail Output will permit the forecasting equations to be re-estimated using the 1981 data. The estimates can then be used to forecast 1983 values for the Productivity Index, which in turn yields the 1983 Adjusted CRI on a quarterly basis.[10]

In summary, it is a straightforward task for the Commission to compute the Adjusted Cost Recovery Index. All of the required data are available to the Commission, and we have provided the formulas for the computations. The computations are simple and inexpensive to perform. In Appendix 3 we provide the computer program we used to develop the actual Productivity Index, based on historical data. Finally, in Appendix 5 we propose a forecasting methodology that can be readily implemented by the Commission staff.

VII. Implementation Of The Adjusted Cost Recovery Index Without Forecasting

This final section of our statement has two purposes. First, we emphasize the fact that the logic of our approach does

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[10] In Appendix 5 we have illustrated these computations using a hypothetical forecast for 1983.

not rely on the use of forecasting to obtain the Productivity Index. Second, we present an alternative program of implementation that uses only historical data.

It is important to distinguish two aspects of our statement. The first aspect is the derivation of the Adjusted Cost Recovery Index from compelling principles. The second, and quite separate, aspect is our proposal to implement the Adjusted CRI by the use of a forecasted Productivity Index -- since data for computing the actual productivity index become available only after an unavoidable passage of time.

The implementation of the CRI itself makes use of forecast information in order to effect cost recovery on a timely basis. We believe that the argument of timeliness is sufficiently strong to justify adjustment of the CRI using a forecast Productivity Index. Nevertheless, we recognize that some observers may be less comfortable with forecasts of changes in productivity than with forecasts of changes in input prices. In order that such discomfort not serve as a barrier to full understanding of the compelling principles underlying our proposal, we wish to clearly spell out how the Adjusted Cost Recovery Index might be implemented using only historical data.

Computation of the Productivity Index requires computation of the Index of Rail Output, which is based on the waybill sample. The waybill sample for a particular year should be available prior to the end of the subsequent year. For example, the 1981 waybill sample should be available prior to the end of 1982. Thus in 1983 the Cost Recovery Index could be adjusted by

the actual Productivity Index for 1981, rather than by the forecasted Productivity Index for 1983. In 1984 the Cost Recovery Index could be adjusted by the actual Productivity Index for 1982, and so on.

EX PARTE NO. 290 (SUB-NO. 4)

RAILROAD COST RECOVERY PROCEDURES - PRODUCTIVITY ADJUSTMENT

Decided March 22, 1989

The Commission's regulations at 49 C.F.R. Part 1135 govern railroad cost recovery procedures. In this decision, we are modifying those regulations to provide for an index of rail costs adjusted for productivity. Productivity is to be measured by a multi-year lagged average. The Commission declined to restate the existing index for past productivity or to adopt any mechanism for partial sharing.

DECISION

BY THE COMMISSION:

In Ex Parte 290 (Sub-No. 4) *Railroad Cost Recovery Procedures - Productivity Adjustment*, served November 17, 1988 and published at 53 Fed. Reg. 17,558 (1988)(Collectively referred to as the, *November NPR*), the Commission announced its intention to make a prospective adjustment to the Rail Cost Adjustment Factor to compensate for the impact of changes in productivity. The Rail Cost Adjustment Factor is an index established by statute[1] intended to reflect the impact of inflation. Rail rates that rise no faster than the index are generally protected from challenge as to their reasonableness.

When the Commission initially published the index in 1981, it did so in a manner that reflected the impact of inflation on the prices paid by the railroad industry for the various inputs from which rail service is produced - labor, fuel, equipment and material.[2] The Commission considered, but rejected, proposals to restate this input index by recognizing the impact of improved productivity on the cost of rail outputs. The Commission reasoned that (1) given the tenuous level of earnings in the industry it would be unwise to limit pricing flexibility, (2) that to do so by offsetting productivity would impair the industry's incentive to become more efficient, and (3) that no workable methodology was available by which to make such an adjustment. The Commission's decision establishing the Rail Cost Adjustment Factor (RCAF) without a productivity adjustment was affirmed by an appeals court, although not precisely along the lines of the rationale offered by the Commission.[3]

In the *November NPR*, the Commission indicated that it would now proceed to make a prospective adjustment to the index because (1) several of the policy considerations relied on in the earlier decision were no longer compelling, and (2) an acceptable methodology had been developed. On this basis, the Commission proposed that a productivity adjustment should be made prospectively to the RCAF index and that the adjustment be based upon the methodology developed by the Commission's independent contractor, Reebie Associates.[4] Under that methodology, the adjustment would be based on the traditional index number approach to productivity measurement. Accordingly, productivity would be measured as the change in the ratio of the output index (based on a composite, revenue-weighted, average of the year-to-year changes in ton-miles for various segments of traffic in the ICC Waybill Sample) over the input index (as measured by total freight expenses calculated using depreciation accounting, plus fixed charges). The Commission further proposed that the annual measurement of industry-wide productivity be based on a five-year moving average, or productivity trend, with a two year lag (to delay the reflection of current productivity gains in the index). Under this proposal, the productivity measure, if implemented in 1989, would be based on the consultant's measurement of average, annual productivity growth over the period 1982-1986 and annual changes in productivity would be evenly spread over the four quarters of each year.

[1] Section 203 of the Staggers Rail Act, Pub. L. No. 96-448, 94 Stat. 1895 (1980), now 49 U.S.C. § 10707a(a)(2)(B) provides that the Commission shall publish a rail cost adjustment factor which shall be a fraction, the numerator of which is the latest published Index of Railroad Costs (which index shall be compiled or verified by the Commission, with appropriate adjustments to reflect the changing composition of railroad costs, including the quality and mix of material and labor), and the denominator of which is the same index for the fourth quarter of 1980, or for the fourth quarter of 1982 or for the fourth quarter of every fifth year thereafter.

[2] *Railroad Cost Recovery Procedures*, 364 I.C.C. 841 (1981) (*RCRP*).

[3] *Western Coal Traffic League v. United States*, 677 F.2d 915 (D.C. Cir.), *cert. denied* 459 U.S. 1086 (1982) (hereafter, *Western Coal*).

[4] Reebie Associates evaluated various methodologies, and recommended, with some modifications, use of the Caves-Christensen methodology originally proposed by a shipper party to this proceeding.

Work on the development of a usable methodology for a productivity adjustment had commenced with the issuance of an Advance Notice of Proposed Rulemaking in 1982, and had focused to a degree on the work of economists Douglas Caves and Laurits Christensen, whose work had been sponsored by a group of shippers. In 1987, the Railroad Accounting Principles Board (RAPB) recommended that the Commission undertake further study of the methodological problems surrounding productivity measurement. The Commission entered into a contract with Reebie Associates (Reebie) to perform this work, and the "Final Report" of Reebie was published for comment in connection with the issuance of the NPR. After review of several possible methodologies, Reebie found that the Caves/Christensen methodology was the most promising and, with certain recommended adjustments, the contractor believed that a satisfactory methodology had been achieved.[5]

Because the Commission tentatively agreed that a usable methodology had been developed, the *November NPR* revisited the policy considerations that had controlled the 1981 decision declining to make such an adjustment. The Commission found that the rail industry had made substantial improvement from what had been a tenuous financial position and that, importantly, this improvement had not come from the widespread use of rates at or near the maximum levels permitted by the RCAF. While the RCAF had risen more than 15% between 1981 and 1986, actual prices averaged something near a 2.2% rise during the same period. (The real, inflation-adjusted, price for rail transport had thus been declining since Staggers, a reversal of earlier trends.)

The fact that most prices had risen far more slowly than the legally protected index rate indicated that rail service was widely disciplined by market forces, demonstrating that productivity improvement was driven by the need to compete and was widely shared with shippers under the existing arrangement. However, captive traffic, where market forces move slowly, if at all might not be likely to benefit proportionately from this process, even though such traffic might contribute to productivity achievement. In order to meet its responsibilities under the Staggers Act to maintain reasonable rates where there is an absence of effective competition, the Commission sought comments as to whether it would now be appropriate to adjust the RCAF index for productivity, such that differential pricing

[5] Reebie was also asked to develop a productivity adjustment for use in connection with the Commission's general purpose costing system. The contractor believed such an adjustment was impracticable given limitations on existing data.

in captive markets would be subject to challenge to a greater degree than during the early, more financially uncertain post-Staggers years.

In response to its *November NPR* the Commission received comments and replies from a wide variety of shipper, rail and government parties. Among those whose participation will be discussed below are the "Concerned Shippers," a group chiefly made up of coal, electric utilities, and other heavy industrial or agricultural users; the Southern Electric System (SES), a group of electric utilities; the National Industrial Transportation League (NITL); the Agribusiness Shippers Group (ASG), generally large agricultural and related shippers; the Association of American Railroads (AAR) representing its membership; Consolidated Rail Corporation (Conrail) appearing on its own behalf and supported by other individual railroads; and the United States Department of Transportation (DOT).[6]

In light of the comments received and for the reasons discussed below, the Commission is adopting, with one minor exception, the use of the productivity adjustment as proposed in the *November NPR*.[7] We will implement this decision by use of two indices, the RCAF (Unadjusted), an index reflecting input prices which will continue to be filed by the AAR, and the RCAF (Adjusted), an index that reflects output (productivity-adjusted) costs. The AAR will also be required to file the RCAF (Adjusted), using numerical values for the productivity adjustment supplied by the Commission. The Commission believes that the record in this proceeding supports the adoption of the productivity adjustment at this time. However, the record has raised several issues concerning implementation of the adjustment, none of which is serious enough to delay today's action, but which warrant additional consideration. These issues will be the subject of our forthcoming Advance Notice of Proposed Rulemaking to be issued in Ex Parte No. 290 (Sub-No. 7), *Productivity Adjustment-Implementation*. The issues to be addressed in that proceeding are: 1) how

[6] Other parties filing commentary include: the Illinois Central Railroad, the Motor Vehicle Manufacturers Association, the Southern Pacific Transportation Company, the American Paper Institute, Certain Coal Shippers, Intermountain Power Agency and the National Association of Regulatory Utility Commissioners. In reaching its determinations in this docket, the Commission has given full consideration to the arguments of all parties whether or not they are discussed specifically.

[7] The *November NPR* proposed using only above-the-line expenses in the construction of the input index. A below-the-line item for one railroad was added to the 1986 expenses in order to treat all special charges consistently. Additionally, the NPR proposed that the productivity adjustment be based on prior industry average productivity over a full business cycle. The rule adopted here provides that a five-year period will be gradually lengthened as more comparable data becomes available.

the impact of contracts on revenues as reported by the waybill sample should be measured and whether and to what extent reported contract revenues create a bias in the productivity measure; 2) how long an averaging period should be adopted, given the determination that the present five-year period may not be the best measure of an entire business cycle; 3) whether the physical input approach for measuring the input index should be substituted for the expenditure approach adopted here; and 4) what is the proper role of below-the-line charges in the construction of the input index. Comments on these issues will assist us in monitoring the impacts of and improving the implementation of the productivity adjustment adopted here.

APPLICABLE LEGAL STANDARD

It is the Commission's view that 49 U.S.C. § 10707a neither directs nor forbids the use of a productivity adjustment to the Rail Cost Adjustment Factor. The language establishing the RCAF process specifies that the Commission shall make appropriate adjustments to reflect the changing composition of railroad costs including the quality and mix of material and labor. But the definition of "appropriate" is not specified and the system of indexing used since the inception of the adjustment index has been weighted so that changes in the composition of costs are recognized. Had Congress intended to require adjustment for productivity it would have been simple enough to say so, but the greater probability is that the Congress believed the issue was complex and better left to the expert discretion of the regulatory agency. We regard this understanding to have been reached by the *Western Coal, supra*, court and the RAPB. *See* n. 3. AAR also believes that the decision whether to include an adjustment is "committed to the Commission's expert judgment." There is, however, opposition to this view.

Mandatory Adjustment

Concerned Shippers view the matter differently. Their argument is that the Staggers Act deliberately created two distinct mechanisms to give rail carriers rate-making flexibility -- the RCAF process and the Zone of Rate Freedom (ZORF).[8] RCAF was to be used for no more than (output) cost recovery while the ZORF, which permits carriers with insufficient

[8] The ZORF provisions are found at 49 U.S.C.§ 10707a(c) and (d).

earnings to take increases of up to 4% above the RCAF index,[9] was the mechanism intended to permit profit enhancement. Concerned Shippers argue that with the RCAF based on input prices, profit levels are now enhanced through productivity improvement, hence there has been little use of the ZORF procedure in the post Staggers period. Concerned shippers believe that their viewpoint was accepted by the *Western Coal, supra,* court. They read the decision in that case as largely rejecting all alternative grounds for refusing an adjustment other than the absence of a trustworthy methodology. Most shippers also take the view that the Commission is under separate obligation to make the adjustment once the RAPB designated productivity as a principle to be recognized in rail costing and recommended its adoption in the RCAF process.

The arguments of Concerned Shippers have more than theoretical interest. If they were to be accepted, the decision we take here would lose its discretionary character, and with it the agency might well lose the authority necessary to monitor and modify the outcome of the adjustment process. Furthermore, the past indices might be found, as Concerned Shippers declare them to be, in error. Hence the arguments for restatement of the index to a level reflecting the accumulated productivity of the post-Staggers period would have some (although we would think still inadequate) support. Such a restatement would have unknown and potentially serious financial implications. We cannot quantify the impact of restatement on contracts, but suspect it would be substantial. There is also no way of foretelling how fast and to what extent revenue recovery through other means would succeed, if restatement led to an immediate substantial reduction in permissible tariff rates.

We do not, however, find the legal arguments of Concerned Shippers persuasive. In the first place, the rate-making framework established by the Staggers Act, which all parties agree was intended to replace a poorly working arrangement under the pre-existing laws, was a substantial departure from prior practice. It included a number of new and untried features, and it is quite logical to believe that Congress would have left the details of implementation to the Commission. Where Congress chose not to, as for instance in the specification of the frequency of publication of the RCAF, it was quite able to spell out its intentions in detail. Unlike Concerned Shippers, we read the *Western Coal, supra*, court as having

[9] These increases are not provided the same level of protection from shipper challenge as are increases taken under RCAF. Carriers are permitted to increase their rates within the statutory limit free from the threat of Commission suspension (49 U.S.C. §10707a(e)(1)(A)(i)), and (49 U.S.C. § 10707a(e)(1)(A)(ii)). However, these increases remain subject to shipper complaint (49 U.S.C. § 10707a(e)(1)(B)).

recognized that the Commission has discretion to make judgments about the index, so long as they are made within the rules of administrative process that govern the exercise of discretion elsewhere.

As to whether the Commission must simply make a mechanical transfer of RAPB principles into Commission rules, we think the answer is that this is clearly not the case. Under the statutory arrangement laid out in Staggers,[10] the Commission must give, and has given, great regard to the recommendations of the Board for modification in our costing rules. For example, in the present context we have felt obliged to consider a productivity adjustment through the rulemaking process, and the recommendations of the Board have had substantial impact on the course of this proceeding. The Commission has given great weight to RAPB's recommendation that "by relying on existing work and presently available expertise, an appropriate productivity measure should be implemented within 18 months of the publication of the Railroad Accounting Principles."[11] As described above, the Commission, with the assistance of Reebie Associates and the expert testimony offered in this proceeding, has endeavoured to determine the availability and workability of a reliable methodology on which to base a productivity adjustment to the RCAF. But it is another matter to say that what the Board recommends must become the rule of law. So saying would undermine the Commission's responsibility to administer the Act and deprive all parties of meaningful judicial review of the substance of the principles laid down by the Board. We do not believe RAPB thought that its findings translated automatically into agency rules.[12]

[10] 49 U.S.C. § 11161 *et seq*. These provisions establish the Railroad Accounting Principles Board, outline its mission, and require that the Commission promulgate rules to implement and enforce such principles. We take as significant the statute's use of the word "implement" in relation to our responsibility and do not read it to mean that the principles need be adopted without opportunity for analysis in the light of the statutory framework for rail regulation. That the Commission is charged with reviewing its implementation and making such changes in the principles as may be required after a five-year period is inconsistent with the notion that the Commission has only ministerial responsibility regarding the adoption of RAPB's findings.

[11] RAPB *Final Report*, at 90.

[12] "A productivity adjustment to the RCAF is neither statutorily required nor precluded. Adjusting the RCAF for productivity is an issue which must be resolved by the ICC in rulemaking. However, the RAPB believes that a productivity adjustment is necessary for the RCAF to measure cost changes accurately." RAPB, *Final Report*, at 90.

Conrail Argument

Conrail believes that the Staggers Act, properly interpreted, forbids an adjustment to the RCAF for productivity. Conrail's argument proceeds from a view of legislative history that sees the decision to "deregulate productivity" as the critical compromise fashioned in the debates over the reform of rail regulation. Conrail finds the elements of this compromise in the so-called "Staggers-Rahall-Lee amendment"[13] which made major modifications on the floor of the House to the rail reform bill initially reported from committee. As a part of this amendment, shippers were given an opportunity under a special provision (ultimately incorporated in Section 229 of the Staggers Act)[14] to challenge any of their existing rates. But so long as these "base rates," as resolved after challenge or left unchallenged -- did not increase in "real terms" -- they would then be considered as conclusively reasonable. Furthermore, as to inflation-driven erosion of these base rates, railroads were to be freed from the lag and burden of regulation -- the rates might be increased without shipper challenge "on a quarterly basis to reflect inflation."[15]

According to Conrail's view, a productivity adjustment, which it refers to as the "re-regulation" of productivity, impermissibly strikes at the heart of the compromise amendment, which (with modifications not fully addressed by Conrail) became the Staggers Act. In support of this view, Conrail points to a variety of Committee and floor statements indicating the Congress' concern with the impact of excessive regulation. Conrail also points to an apparent anomaly to support its view that Congress meant to deregulate productivity. According to Conrail, if there had been no inflation subsequent to Staggers, a productivity-adjusted index would have declined rapidly. But rates could not have been forced below the base rate floor since such reductions would have been prohibited by operation of Section 229. Hence productivity could have been retained in the absence

[13] 126 Cong. Rec. 24376-24386 (1980). The amendment contains new or modified language covering many of the most critical features in the final Staggers law.

[14] Section 229 first appeared in the House as section 330 of the Staggers-Rahall-Lee amendment.

[15] This language is contained in section 305 of the Staggers-Rahall-Lee amendment to H.R. 7235; it was adopted by the House on September 9, 1980 and sent to the Senate for conference. *See* 126 Cong. Rec. 24380, 24883, and 24888 (1980).

of inflation, but, under the Commission's proposal, it must be passed through to shippers when inflation occurs.[16]

Conrail further states that the decision in *Western Coal, supra*, leaves open the possibility that a declination to adjust the RCAF for productivity on policy grounds would be sustained if a more adequate rationale were articulated. Conrail finds the basis for such a rationale in its argument over the proper interpretation of the Staggers Act legislative history.

Just as we are not convinced that we lack discretion to order an adjustment, Conrail has not convinced us that we are forbidden to proceed. Conrail's view of the legislative history of Staggers is too narrow to be credited and in parts it is lacking in significant detail -- detail which substantially undermines the Conrail view. The Staggers-Rahall-Lee amendment was indeed central to the design of the final reform bill, but the amendment went far beyond the RCAF issue. It was a broad rewriting of the original House committee bill (a part of which had already been adopted and would be modified), and the amendment's purpose seems to have been to bring the House bill more in line with provisions that had been adopted in the Senate.

Earlier in the legislative debate the Senate had transmitted a bill to the House which contained an RCAF provision in which the escalator was to be a quarterly restatement of an index of rail costs "with appropriate adjustments to reflect the quality and mix of material and labor." The Staggers-Rahall-Lee amendment differed from the Senate approach by indicating that the quarterly index was simply "to reflect inflation." Unfortunately for Conrail's argument, it was not the House version that survived conference but a modified version of the Senate bill.[17] The legislative language actually enacted gives the Commission the authority to "make appropriate adjustments to [the RCAF] to reflect the changing

[16] While the language of Section 229 may superficially support this reading, we attach little weight to the apparent anomaly. Given the historical circumstances facing Congress (specifically, substantial and apparently chronic inflation) in 1980, we have no doubt that Congress did not address or have any intentions regarding the working of the RCAF adjustment process in a period of prolonged price stability.

[17] As the Staggers Conference Report states "[t]he adjusted base rate is computed quarterly by means of a rail cost adjustment factor, as contained in the Senate bill." H.R. Rep. No. 1430, 96th Cong., 2d Sess. 93 (1980). Conrail points to Report language characterizing the Senate provision as an inflation safeguard. The report language is not sufficient to overcome the fact that, as a result of the conference between the Senate and the House, the pure inflation adjustment of the House was dropped in favor of an index that was to be adjusted by the Commission to reflect changing cost patterns as the Commission judged appropriate.

composition of rail costs, including the quality and mix of material and labor."

Whether a productivity adjustment is "appropriate" is a judgment requiring exercise of our discretion and expertise. It involves, as we will next consider, a variety of policy and methodological issues. But it is not, as Conrail would like to characterize it, an argument over the "re-regulation" of productivity. The Staggers Act, as influenced by the Staggers-Rahall-Lee amendment, contains a host of provisions involving the enunciation of a new national policy, the recognition of the right to contract, the use of exemptions, the statement of new standards for judging reasonableness, the creation of a jurisdictional threshold -- none of which are at issue here. These provisions have completely altered the pre-1980 regulatory framework. Adjusting the RCAF for productivity, while certainly important, does not constitute wholesale rewriting of the Staggers "compromise." We are engaged in a rather more limited inquiry into the question of whether the Commission's responsibilities to maintain reasonable rates in the absence of competition and to foster independent pricing by individual railroads should now be given precedence over earlier concerns regarding the uncertain financial state of the rail industry and its incentives to become productive and efficient.

POLICY CONSIDERATIONS

The AAR and Conrail object to the Commission's proposal on the grounds that it would reduce profits and thus inhibit progress toward the statutory goal of revenue adequacy. The railroads identify three problems. First, they argue that a productivity adjustment would result in "double recovery" -- the pass through to shippers of more than 100% of all productivity. Market forces, they say, already force railroads to pass all productivity gains through to shippers in competitive markets. Second, the railroads contend that adoption of the proposal will result in the "re-regulation" of rates. Additional rate regulation will result and is, in their view, objectionable because alternative rate-making provisions which could be used to increase profitability are more difficult, costly, and subject to greater regulatory scrutiny. It is also objectionable because increasing the costs and risks of rate making will further jeopardize the achievement of revenue adequacy. Third, they assert that the proposal reduces the incentive to become more productive by reducing the expected benefits of adopting cost saving productivity measures. If railroads do not believe that their earnings will improve sufficiently by investing in productivity-enhancing projects, they will not undertake many socially worthwhile investments.

This, they argue, will result in higher costs and less chance for a financially sound rail industry.

Pass Through of Productivity Gains

AAR contends that productivity gains are already being passed through to the shippers and that the inclusion of a productivity adjustment in the quarterly RCAF process would result in a double recovery for shippers. AAR argues that the competitive marketplace already transfers specific productivity gains to particular shippers in the form of lower rates which reflect traffic-specific productivity improvements. It contends that productivity gains do not occur evenly across all railroads and across all segments of traffic, although it recognizes that some improvements, such as national collective bargaining, occur industry-wide and that system-wide improvements on individual railroads are not uncommon. But AAR concludes that the use of the proposed industry-wide average would result in the improper distribution of gains and a double recovery.

Concerned Shippers and other shipper parties argue that a productivity adjustment would not result in a double pass through. They argue that there is no proof that productivity improvements occur at a greater or a lesser rate in captive markets than in competitive markets. They also allege that, on average, rail rates are above costs and that there is a growing divergence between rates and cost. Concerned Shippers believe that this is proof that no double recovery occurs. They argue that rates would more clearly track the cost of service if all productivity had been passed through. Shippers recognize that railroads which use *only* the RCAF mechanism to set rate levels would be forced to pass on productivity gains to captive shippers -- though on a delayed basis. But they contend that the RCAF is not a rate ceiling but a challenge-free zone. They argue that there are several alternative ways to raise rates. Concerned Shippers conclude that, since a reduced maximum RCAF rate level may not necessarily result in a reduced rate, uneconomic pass through is not likely to occur.

AAR has not convinced us that there will be a "double" pass through in any meaningful sense. While there is agreement that much achieved productivity is now passed on to shippers, where it is achieved and to whom

it is passed are less clear. And why there would be an excess pass through is simply not established.[18]

AAR inconsistently argues that productivity is achieved primarily in specific markets, but later, that it is often achieved in national bargaining or in system-wide labor buy-outs. Clearly, there is a substantial element of both kinds of improvement. And just as clearly, the latter have an impact on output costs in many captive markets. There is also no reason not to believe that market-specific improvements are made with some frequency in captive markets. And there is reason to ask whether any of the productivity achieved in a captive market or affecting it through system-wide improvement is passed to the captive shipper. The implication from AAR's double-pass through argument is that the pass through in captive markets is negligible. Consequently, AAR's argument may be restated as follows: the RCAF process was meant to allow the railroads to recover all costs imposed on the system through inflation; recovery is stymied in many markets by competition; railroads are thus permitted to make this up by increasing the margin of recovery from captive traffic.

Once the argument about avoiding a pass through in captive markets is seen in these terms, we think the issue of double pass through can be redefined as another version of the more general argument over the degree to which differential pricing is an essential part of the achievement of revenue adequacy. We do not dispute that it is important, nor do we believe that price differentials between customers, commodities, markets, and regions are necessarily perfect or should necessarily remain undisturbed. It may be that captive traffic needs to contribute more to the bottom line of some railroads, perhaps less to others. That is not the point here. The point underlying the policy enunciation in the NPR is that we believe that the health of the industry is such that any further upward adjustment in the margin contributed by captive traffic should generally be taken outside of the RCAF process so that if any abuse of market power

[18] The offer of a mathematical demonstration in the Verified Statement of Witness Baumol is not convincing, proceeding as it does from a combination of incorrect and unproven assumptions. Baumol argues that where productivity is produced in competitive markets, competition forces at least partial pass through, and that if there has been no similar productivity achieved in captive markets, an RCAF adjustment will leave the rates recovered through the combination of competitive pricing and RCAF recovery below the level of increase in output costs. However, there are alternative means to raise rates in captive markets, a point which standing alone thoroughly undermines this offer of mathematical proof. An equally telling point is that the proof assumes that productivity is not achieved in captive markets, or that, if it is, it is passed to shippers despite the fact that under existing procedures neither the market nor the Commission compel it.

exists, it will be subject to redress.[19] Since we believe, as next discussed, that effective pricing alternatives are available, we are not convinced that this decision will deprive the rail industry of the opportunity to continue to adjust its prices in an economically efficient manner. [20]

Re-regulation of Railroad Ratemaking

AAR and Conrail assert that the proposed productivity adjustment would lead to increased regulation of railroad rates. This alleged "re-regulation" would occur because the RCAF index, if adjusted for productivity, would rise too slowly (or decline) thereby lowering the adjusted base rate. The adjusted base rate is the challenge-free rate level established by the RCAF. To preserve their challenge-free status, maximum RCAF rate levels would have to be reduced when the RCAF declined. But since rates at the new index level would no longer suffice to provide sufficient capital recovery, the railroads claim that they would have to charge prices outside of the challenge-free zone.

The alternative non-RCAF rate making provisions which would allow railroads to recover fully cost increases and enhance their profits by increasing rates above the challenge-free zone are, in the railroads' opinion, too risky, costly and slow to be applied in a broad fashion. Accordingly, the railroads contend that non-RCAF rate mechanisms simply cannot be used to change the large number of individual and joint rates that need to be increased in the face of rising costs. The railroads claim that non-collective rate increases could require "several hundred thousand concurrences by

[19] When considering rate levels, abuse of market power is found to exist when rates exceed stand alone costs (the costs that would be incurred by a shipper or group of shippers in offering alternative service). AAR and its experts have championed this stand alone concept in other proceedings, but here seem to ignore it in favor of index-driven rates that could exceed stand alone costs over time and yet remain free from challenge. Witness Kahn for the Concerned Shippers has identified this inconsistency and argued the existence of a necessary connection between stand alone costs and the sharing of productivity. Verified Statement of Alfred E. Kahn, (Jan. 1989), particularly at 6-9.

[20] Conrail, asserting that the current mechanism has not harmed any shippers and that the only justification for forcing the railroads to share productivity is evident abuse, offers as an alternative to index adjustment the proposition that the railroads be permitted to retain all productivity gains except where a captive shipper shows that its rates are unreasonable under stand alone costing. The Conrail proposal would put the burden of making this showing on the shippers in every case, and that is its principal fault. Like Conrail we do not believe that abuse has been demonstrated, but we also believe that the traditional procedures for judging the reasonableness of rates should be followed.

other participants in the railroad's joint rates."[21] The alternative of abandoning the joint rate structure is in their opinion even more cumbersome and difficult. Apart from the difficulty of filing individual rate increases, the railroads state that defending them will also be costly and time consuming.[22] In such an environment, the railroads assert that their financial condition will decline.

For their part, shippers argue that the proposed adjustment would not undo the deregulation which the railroads have experienced under Staggers. To the contrary, they assert that the RCAF was never intended to permit the railroads to recover any more than output cost increases and that the railroads are free to enhance revenues via other rate making mechanisms in accordance with market forces or, in the case of captive shippers, the Commission's maximum rate guidelines. These shippers further argue that the railroads' contentions regarding the risks and costs of using other rate making provisions are exaggerated. Under Staggers, the shippers assert, most railroad rates have been deregulated. Some traffic has been completely exempted from regulation while other traffic is exempt because its rates are below the jurisdictional threshold. Even where rates are above the jurisdictional threshold, a challenge requires showings of both market dominance and rate unreasonableness. These rate provisions have, in the shippers' opinion, established barriers for shippers that are very difficult and costly to overcome. As a consequence, shippers claim few rates are ever challenged and virtually none are suspended.

With regard to the joint rate issue, Concerned Shippers dismiss the railroads' arguments as exaggeration. They note that under the current

[21] Reply Comments of AAR, (Jan. 1989) at 22. The railroads contend that since each connecting carrier must concur in each joint line adjustment, a great deal of time must be spent sending requests for concurrences, waiting for responses, analyzing responses and deciding on and making counter proposals when connections do not concur. AAR argues that the back-and-forth negotiations between railroads involved in the making of and agreeing on counter proposals is time consuming and results in both delay in achieving rate adjustments and diversion of marketing and sales staff from developing new markets and increasing market share. AAR concludes that, unless railroads invest in vast additional marketing staff, extensive delay will result and massive revenues will be lost. One major railroad's witness estimates that it would take six months to ascertain the proper information and propose joint line rate adjustments and a year or more before concurrences were received.

[22] Although railroad witnesses concede that single-line increases can be published relatively promptly, they argue that the period required to decide such increases is lengthy. AAR claims that the decision to make selective single line increases involves intensive internal debate on which elements of traffic to increase and by how much. Additionally, AAR argues that even a unilateral adjustment equal to an RCAF increase would require a separate quarterly adjustment to each tariff. The result, the railroads argue, is delay and lost revenue.

procedures, carriers have to agree in advance on the automatic application of the RCAF. These shippers assert that the railroads could in a similar fashion agree on other escalation mechanisms which supplement the RCAF. In any event, these shippers argue that the railroads could always cancel their joint rates and publish proportional rates.

We are unpersuaded by the railroad's arguments that their ability to achieve revenue adequacy would be impaired by the potential for increased regulatory supervision of future rate increases. In the first place we believe the railroads have overstated the case significantly. The Staggers Act provided the railroads with rate freedoms which extend beyond the challenge-free zone of the RCAF. One of the primary objectives of the Act was to permit the railroads broad rate flexibility as long as the rates on captive traffic did not exceed reasonable levels. To insulate the railroads from excessive regulation, the Act established several provisions that would operate to minimize the impact of unnecessary regulation.

To begin, § 10709, 49 U.S.C. § 10709 (containing language introduced into the 1980 law by the Staggers-Rahall-Lee amendment discussed above), establishes a jurisdictional threshold below which rates cannot be challenged. That threshold currently requires rates to exceed variable costs by more than 180% before the Commission can entertain a complaint arguing that a rate is unreasonably high.[23] An analysis of railroad rate levels based on the ICC's costed waybill study for the last several years indicates that only 20 to 25% of all railroad movements (measured by tons) exceed the jurisdictional threshold. Much traffic moves under contract and thus is not challengeable.[24] Other traffic, including broad categories such as TOFC/COFC and box car carriage, have been removed from rate regulation under the enhanced exemption authority provided in the Staggers Act.[25] As a consequence of these Staggers Act changes, the possibility that a change in indexing policy will re-invent the excessive rate and tariff regulation of the pre-Staggers years is very slight.

That adoption of our proposal will result in some change in the industry's and the Commission's way of doing business is not disputed. The

[23] Section 10709 further requires that it be shown that the offending rail carrier has market dominance over the traffic at issue. Finally, the rate itself must be shown to be unreasonable.

[24] In 1986 the AAR estimated that, as of June 1985, 62% of coal and 57% of grain tonnage was under contract. (*See Railroad Freight Rates in the Five Years Since Staggers,* Association of American Railroads, January 1986.) Traffic moving under contract is subject to very limited challenge not directed to the level of the rate charged. Prior to Staggers the legality of contract pricing was unclear and the use of contracts was minimal. *See* Staggers Act, section 208, amending §§ 107 of Title 49 to add new § 10713.

[25] *See* Staggers Act, section 213, amending 49 U.S.C. § 10505.

Staggers Act encourages individual pricing, and the present action will lead in that direction. We recognize that the most likely area for difficulty will be the implementation of price changes involving joint rates. But the argument that joint rate negotiation between railroads will now become unworkable is not convincing. At present the industry is capable of deciding on its concurrences under the RCAF tariff and the selection of discounts and flag outs and such from the RCAF index as they affect joint line movements. We are confident that new procedures can be developed should it turn out that the rate of increase in the new index necessitates them. Necessity forces invention, as has been said elsewhere.[26]

Still the major point in rebuttal of the re-regulation argument is, however, that only some fraction of the traffic base regulated in the pre-Staggers years is likely to be affected at all by the changes made here, at least so far as reasonableness challenges before this Commission are concerned. The jurisdictional threshold and the exemptions issued under 49 U.S.C. § 10505 insure that an even smaller percentage is likely to be found captive. But as to captive traffic, Congress intended that the Commission continue supervision. Without some modification of the present indexing methodology, this supervision might be hard to retain.

Nor are we convinced that such increased transactional costs as might arise under our proposal are sufficient justification to maintain the status quo. Estimating the costs that will arise from non-RCAF pricing is difficult. Where the railroads have relied on the RCAF, this course of action has been followed because it resulted in the lowest costs and risks -- had independent actions been cheaper and easier, we would have seen many more of them. Thus, the railroads are correct when they argue that the use of other rate making provisions will be somewhat more expensive and risky.[27] However, this self evident argument is not sufficient to justify the

[26] *See American Short Line RR Assn. v. ICC,* 751 F.2d 107 (2d Cir. 1984). Here the railroads argued the unworkability of the RCAF process as a replacement for the pre-existing general rate increase format. These fears have since been overcome.

[27] The internal railroad procedure for increasing a given rate via the RCAF or via another means is not likely to be substantially different. Since market forces really dictate price levels for most railway traffic, as the railroads contend, it is unclear how the decision-making processes of pricing officers would differ just because a productivity adjustment is added to the quarterly RCAF. Railroad pricing officers now make RCAF rate decisions and then communicate with a tariff publishing officer who files a tariff within ten days of AAR's quarterly proposal. There is no insurmountable reason why rate increase decisions outside the RCAF cannot be made just as quickly. While some additional resources may be required by the railroads to make such independent rate changes, we have not been persuaded that the railroads will incur excessive risk or expense in taking such rate actions. But only experience will demonstrate the degree to which such problems are real. The Commission will observe the consequences of its decision with care.

current system if it is not consistent with goals and provisions of the Interstate Commerce Act as amended by Staggers. As noted, Staggers encouraged independent ratemaking. Section 10101a of Title 49 states that it is the policy of the United States Government to require rail carriers, to the maximum extent practicable, to rely on individual rate increases, and to limit the use of increases of general applicability. That same provision expresses the Congressional desire that reasonable rates be maintained in the absence of competition. Regulation was to be minimized, but not to the point of excluding the achievement of other goals.

Productivity and Railroad Incentives

The AAR and Conrail contend that the adoption of a productivity adjustment to the RCAF would weaken railroads' incentives to improve productivity by increasing the costs and reducing the expected benefits of innovation. Recognizing that the proposal contained in the NPR limits the flow through of productivity growth to a lagged industry average, AAR concedes that individual carriers will still retain some incentives to innovate. Nonetheless, it asserts that these incentives will be diminished, particularly for revenue inadequate carriers. Accordingly, it argues that revenue inadequate railroads will have more difficulty in raising capital. If carriers perceive that investment in productivity-increasing activities will not improve their earnings, otherwise productive investment will decline, and the Staggers Act goal of an efficiently maintained, privately-owned, revenue adequate rail system will be jeopardized.

AAR also asserts that the use of an industry average is not necessarily in the public interest. In an effort to make this point, it argues that the substitution of an arbitrary target for the industry average should, under the NPR's premise, yield the same or more incentives to individual carriers to increase their productivity. AAR's witness Baumol suggests, as an example, that if a 30% target were set, "[it] would still leave individual carriers with the same sort of 'incentive' to increase their productivity that is cited by proponents of adjustment as a means of minimizing the penalty."[28] Yet, such an extreme standard would destroy the cost recovery aspects of the RCAF--the AAR's point being that retaining some incentives is a necessary but not a sufficient condition for an adjustment of the index.

[28] V. S. of William T. Baumol (Dec. 1988), at 21.

AAR also believes that the proposed use of industry average productivity will negatively affect productivity growth in the railroad industry because much of the research and development is conducted at the industry level. Since these activities are essentially collective, the incentives to conduct such activities would be sharply reduced by an industry average adjustment. Similarly, AAR asserts that individual firms will be reluctant to innovate if they believe that other firms will imitate their improvements.

In addition to its theoretical arguments, AAR provides the testimony of railroad executives representing several major carriers. In essence, these executives assert that investment decisions in the railroad industry, as in other industries, are made on the basis of expected return. Typically a target rate of return is established. Investments not meeting that target are not undertaken. The various executives state that the adoption of the proposed productivity adjustment to the RCAF would force them to review their investment decisions and the result would likely be that fewer potential investments would meet the target return.

Shippers such as Concerned Shippers, American Paper Institute, Inc. and Agribusiness Shippers Group disagree with the railroads' conclusion that the proposed productivity adjustment will reduce incentives to engage in cost cutting activities. Noting that most railroad rates are set in competitive markets, Concerned Shippers argue that railroads must improve their productivity in order to survive in these markets. Concerned Shippers also dispute the AAR's contention that incentives to innovate are weakened by the revenue inadequacy of the railroad industry. They point to two major flaws in the railroads' argument.

First, they assert that the focus must be on individual firms, not the industry. In competitive industries an individual firm will undertake productivity enhancing activities if it believes it can improve its earnings. Failure to undertake such activities, on the other hand, results in declining profit and eventual extinction. Second, the AAR fails to distinguish between return on average investment and return on incremental investment. According to Concerned Shippers:

> The economic test of when and which productivity-improving methods or investments should be introduced is that the *incremental* cost of making the change--including the cost of any *incremental* investments it requires--be lower than the promised savings, both in present value terms.[29]

[29] V. S. of Alfred E. Kahn (Jan. 1989), at 9.

They further assert that to the extent that innovation requires the application of additional capital, capital markets will provide the necessary funding as long as the incremental investment promises to cover its cost of capital. It is the Concerned Shippers' opinion that the proposed productivity adjustment--with its lagged implementation based on an industry average--preserves such incentives in a revenue inadequate industry because the economic test described above will be unaffected by the adjustment. In addition, they assert that competition in competitive markets requires the pass through of productivity gains in spite of the industry's revenue inadequacy. What the railroads object to, in the opinion of Concerned Shippers, is providing the same adjustments in captive markets.

In *RCRP* we concluded that the adoption of a productivity adjustment, even when based on an industry average, would discourage railroads from making productivity related innovations. In addition, we expressed some concern that the use of an industry average might unfairly penalize individual railroads which could not take advantage of productivity enhancing innovations because of their traffic mix or geographic location. The record in this proceeding and the changes in the nature of the transportation market have caused us to re-think our prior conclusion on this issue. As amply pointed out by both sides, competition in transportation markets has increased dramatically since the passage of the Staggers Act. By their very nature, these markets *require* individual carriers to seek out and implement ways to reduce costs. Failure to do so, as recognized by witnesses on both sides, would eventually require non-innovative carriers to exit from the market. Thus, the incentive issue is not one-dimensional. It is not simply the size of the carrot which is at issue. Equally important is the stick which penalizes carriers which fail to effectively compete. It is hard for us to imagine that railroads would forego important productivity enhancing innovations so that they would not, over time, have to share them with that portion of the market which may be captive. And this is equally true for productivity gains achieved at the industry level. The credibility of the railroads' arguments is further damaged by the commonly agreed upon fact that few rates have been increased by the full RCAF. Competition is forcing the railroads to share productivity gains, as expected.

Our 1981 decision in *RCRP* suggested that harm to an individual carrier which cannot take advantage of productivity improving innovations might be avoided by making the productivity adjustment on a carrier-by-carrier basis. We now believe that the possibility that a carrier might be harmed by a productivity adjustment because it cannot participate in such innovations is relatively remote. Railroad consolidation over the past nine years has resulted in fewer railroads. These railroads now comprise broad

systems which compete geographically and are similar in other ways. Consequently, technologies and innovations which improve productivity tend to have broader applicability than they might have had in 1981 when railroads were more heterogeneous and geographically dispersed.

While the use of carrier-by-carrier productivity might solve the potential problem raised in the 1981 decision, it would take away a significant share of the productivity gains achieved by a railroad and would certainly discourage investment. However, the use of a lagged average of at least five years allows each railroad to preserve the benefits of productivity over an extended period of time. More importantly, the use of an industry average provides each railroad with both the incentive and opportunity to beat the average. The AAR's argument that an arbitrary target (such as 30% annual productivity growth) would be equally effective in retaining some incentives but would destroy the cost recovery aspects of the methodology is misdirected. Once we decide to reflect actual productivity in the index, the industry average is the only reasonable target. As Concerned Shippers point out, this target has been attained in the past and it is the only measure of productivity which converts the industry average RCAF input price index into an industry average output cost index.

The statements by railroad executives suggesting that they would re-evaluate investment decisions by reducing the magnitude of the expected benefits if the proposal is adopted are unconvincing. In order for a carrier to correct for the proposed productivity adjustment, it would have to anticipate the rate at which other carriers would imitate its innovations, compute the impact of its innovation on industry productivity, and then compute lost benefits over the phase in period, while taking into account the possible losses in profitability from erosion of market share if costs are not reduced. The ability of any carrier to make these computations accurately is questionable at best. The same problem exists with their assertion that the proposed adjustment would have the greatest negative impact on revenue inadequate railroads. These carriers presumably have powerful incentives to improve their financial condition. Furthermore, the decision of whether or not to invest in productivity enhancing activities is not primarily a function of average return on investment. As witness Kahn for Concerned Shippers explains, a railroad's decision to make investments is a function of the incremental costs and benefits associated with each investment. Thus, a railroad's willingness to undertake productivity enhancing projects only depends on the costs and benefits of those specific projects and not on whether the railroad's overall earnings are inadequate. It is simply not credible that the diffused and non-quantifiable sharing of productivity gains with a limited number of captive shippers would influence a railroad's investment decision-making to the exclusion of all other